22 **American Geriatrics Society**. Guideline for the prevention of falls in older persons. *J Am Geriatr Soc* 2001;**49**:664–72.
23 **Brignole M**, Alboni P, Benditt D, *et al*. Guidelines on management (diagnosis and treatment) of syncope. *Eur Heart J* 2001;**22**:1256–306.
24 **Parry SW**, Seifer CM. Monitoring devices for falls and syncope. In: Kenny RA, O'Shea D, eds. *Falls and syncope in elderly patients*. Philadelphia, PA: WB Saunders, 2002.
25 **Novak V**, Spies JM, Novak P, *et al*. Hypocapnia and cerebral hypoperfusion in orthostatic intolerance. *Stroke* 1998;**29**:1876–81.
26 **Cencetti S**, Bandinelli G, Lagi A. Effect of $P_{CO_2}$ changes induced by head-upright tilt on transcranial Doppler recordings. *Stroke* 1998;**28**:1195–7.
27 **Grubb BP**, Gerard G, Roush K, *et al*. Cerebral vasoconstriction during head-upright tilt-induced vasovagal syncope: a paradoxic and unexpected response. *Circulation* 1991;**84**:1157–64.
28 **Lagi A**, Cencetti S, Corsoni V, *et al*. Cerebral vasoconstriction in vasovagal syncope: any link with symptoms? A transcranial Doppler study. *Circulation* 2001;**104**:2694–8.
29 **Zhang R**, Zuckerman JH, Iwasaki K, *et al*. Autonomic neural control of dynamic cerebral autoregulation in humans. *Circulation* 2002;**106**:1814–20.
30 **Pearse R**, Ballard C, Hampton J, *et al*. Prevalence and profile of cognitive impairment and dementia in carotid sinus syndrome (CSS) and carotid sinus hypersensitivity (CSH) [abstract]. *Clin Auton Res* 2004;**14**(Suppl):A29.
31 **Kenny RA**, Shaw FE, O'Brien JT, *et al*. Carotid sinus syndrome is common in dementia with Lewy bodies and correlates with deep white matter lesions. *J Neurol Neurosurg Psychiat* 2004;**75**:966–71.
32 **Larsen FS**, Olsen KS, Hansen BA, *et al*. Transcranial Doppler is valid for determination of the lower limit of cerebral blood flow autoregulation. *Stroke* 1994;**25**:1985–8.
33 **Kontos HA**. Validity of cerebral arterial blood flow calculations from velocity measurements. *Stroke* 1989;**20**:1–3.
34 **Daffertshofer M**, Hennerici M. Cerebrovascular regulation and vasoneuronal coupling. *J Clin Ultrasound* 1995;**23**:125–38.

# IMAGES IN CARDIOLOGY

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## Brugada syndrome unmasked by a shift of right precordial leads

A 40 year old man was admitted to the emergency department for syncope. He had no previous episodes. The initial assessment revealed a blood pressure of 120/80 mm Hg and a heart beat of 70 beats/min. The examination revealed no abnormality. The laboratory tests showed a moderate increase in serum lactate (23 mg/dl, 2.55 mmol/l). The first ECG undertaken by a student revealed a rate of 70 beats /min and a coved ST segment elevation of 1.5 mm in V1 and V2 leads followed by a negative T wave. The second ECG performed by a nurse revealed a rate of 70 beats /min and a normal repolarisation.

We then performed an ECG with the right precordial leads placed in the fourth intercostal space (panels A and B), and in the third and second intercostal spaces (panels C and D). These modifications unmasked ECG abnormalities suggestive of a Brugada syndrome: the type 2 pattern (panel C) with a saddleback-type ST segment elevation in V1 and V2 leads and a positive or biphasic T wave; and the type 1 pattern (panel D) with a coved ST-T segment elevation $\geqslant$ 2 mm (0.2 mV) in V1 and V2 leads followed by a negative T wave.

Placement of the right precordial leads in a superior position (up to the second intercostal space above normal) can increase the sensitivity of the ECG for detecting the Brugada phenotype, both in the presence or absence of a drug challenge.

A programmed electrical stimulation was performed on our patient and a sustained ventricular arrhythmia was induced. Following recommendations, the patient received an implantable cardioverter-defibrillator.

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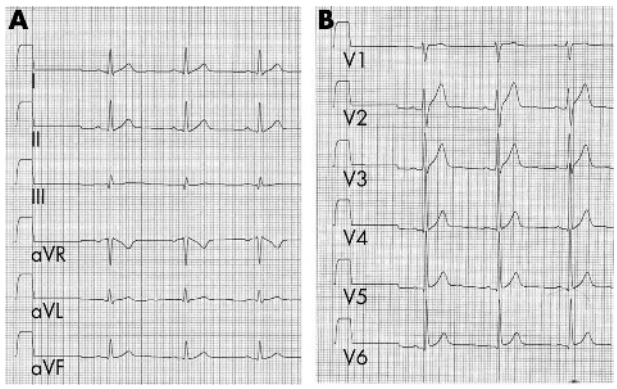
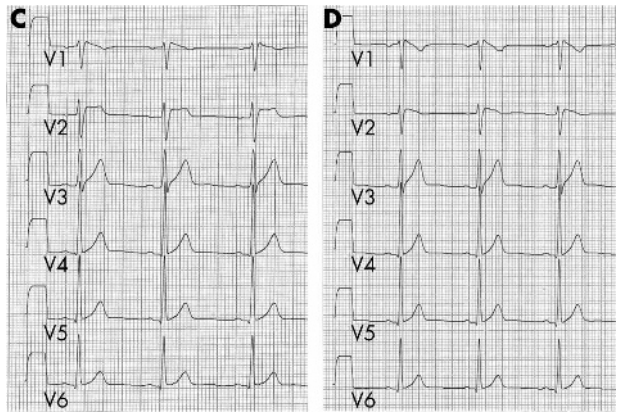



ECG with the right precordial leads placed in the fourth intercostal space (A, B).




ECG with the right precordial leads placed in the third (C) and in the second (B) intercostal space.